Ficha de Unidade Curricular (FUC)

1. Unidade curricular

IPI – Independent Power Generation Plants

2. Docente responsável e respetiva carga letiva na unidade curricular (preencher nome completo)

Eduardo Adelino M. Nunes Eusébio	*6,0 h*

3. Outros docentes e respetivas cargas letivas na unidade curricular

Cristina Inês Camus	*3,0 h*

4. Objetivos da aprendizagem (conhecimentos, aptidões e competências a desenvolver pelos estudantes)

It is intended that student to be able to do the several parts related to an Independent Power Generation Plant design, including the energy transportation up to a previously defined point of the national electrical grid.

5. Conteúdos programáticos

- *Private electrical infra structures related to the project of an Independent Power Generation Plant:* mainly specific installations either in alternating current or direct current at low and medium voltage, electrical schemes, cable dimensioning and routings and electrical protections.
- *Private switchgear of a generation plant:* design and development of the lay-out, electrical schemes, arrangements and circuits dimensioning.
- *Overhead transmission line to the public grid:* definition of the inherent parameters, electrical or mechanical, namely electrical voltage, short-circuit current, power cables, routing and land implementation showing the equipment characteristics on the land cross *section.*

6. Demonstração da coerência dos conteúdos programáticos com os objetivos da unidade curricular

After being approved in his examination, student should be able to deal with the following matters:

- To design the electrical installations of an Independent Power Generation Plant:
- To read and to interpret the legal electrical regulations, national and international standards applied to energetic sector;
- To design the electrical infra structures inherent to the generation plant and connection to the public grid, namely wind farms, mini-hydro plants, cogeneration plants, geothermal plants, etc;
- To apply the specific informatics tools (either commercial or specifically developed for the subject).

7. Metodologias de ensino (avaliação incluída)

In the theoretical classes (T) are educated the concepts and legislation to be used in the UC.
In the theoretical/practical classes (TP) calculations and dimensions inherent to the different components existing in the project are made based on the theoretical concepts.
In laboratory classes (PL) group students apply the skills acquired in T and TP in the practical development of the project.

Evaluation is achieved by the elaboration of a final project, as per paragraph 2.1.5 of "The Skill Evaluation Procedures" (internal decree nr. 07/CD/2002, dated 30 December). The jury will be composed by at least two professors one of them the head of discipline.

The student is successful, if he reaches ten points in a scale of zero to twenty.

8. Demonstração da coerência das metodologias de ensino com os objetivos de aprendizagem da unidade curricular

Prepared by students of a final project contemplating real applications of the content of the course through the execution of documents with a strong connection to the procedures required in the professional activities.

9. Bibliografia principal

Principal:

- Fernando Loureiro, Elementos de apoio à unidade curricular (Grupo Disciplinar de Instalações Eléctricas – IPI), ISEL, 2012
- ABB, Switchgear Manual 11th edition, Germany, 2006
- John D. McDonald, Electric Power Substations Engineering, CRC Press, UK, 2007
- C. Avril, Construction des Lignes Aériennes à Haute Tension, Ed. Eyrolles, France, 1979
- Regulamentação e Normalização de Linhas Eléctricas e de Subestações, vários anos
- Ismail Kasikci, Short Circuits in Power Systems – A practical guide to IEC 60909, Wiley VCH, Germany, 2002

Complementar:

- John Twidell & Tony Weir, Renewable Energy Resources, Tayler & Francis,2007
- Gunter G. Seip, Electrical Installations Handbook, MCD Verlag, Germany, 2000
- James H. Harlow, Electric Power Transformer Engineering, CRC Press, UK, 2004
- DGEG, Guia Técnico de Produção Independente editado pela DGEG
- Fernando Loureiro, Coletânea de documentos base para projectos de linhas de MT, ISEL, 2006